07 50 00 • MEMBRANE ROOFING

SECTION INCLUDES

Built-up Roofing
Modified Bitumen Roofing
Rolled Roofing
PVC Roofing
EPDM Rubber Roofing
TPO Roofing
Access Walkways
Roof Coatings

RELATED SECTIONS

04 20 00	Masonry
05 10 00	Structural Steel
05 55 00	Miscellaneous and Ornamental Iron
06 10 00	Rough Carpentry
07 11 00	Waterproofing and Damproofing
07 20 00	Building Insulation
07 30 00	Asphalt Shingles
07 45 00	Gutters and Downspouts
07 46 00	Prefinished Metal Trim
07 90 00	Sealants
14 00 00	Elevators
22 00 00	Plumbing
23 00 00	HVAC
26 00 00	Electrical
28 00 00	Electronic Safety & Security

For Contracts estimated over $100,000 that are predominately Roofing Work the DCAM category for the General Contractor should be Roofing. An alternative is to have the DCAM category as General Building Construction but will require filed sub-bids for the roofing. This requirement needs to be clearly spelled out in the Advertisement.

Filed Sub Bid

M.G.L. c.149 §44F

When replacing membrane roofing is part of a larger General Contract, Roofing is a stipulated filed sub-bid category under M.G.L. Chapter 149, §44F. While different types of roofing are typically specified in different specification sections, if the project's total cost is over $100,000 and the cumulative estimated value of all roofing work exceeds $20,000.it triggers the filed sub-bid requirement. It is then better to specify all roofing work in a single section to avoid confusion

INVESTIGATION AND RESEARCH

The choice of materials may vary depending on many factors for every roof contract:

- ❑ Existing Conditions/Materials/Details (Reroofing contracts)
- ❑ LHA's Capacity for maintaining a specific product.
- ❑ Location of Building and the difficulty of getting materials to the roof.

- ❑ Type of Occupancy, some tenants have problems with strong odors.
- ❑ Expected Use - if residents have access to roof, address the issue of roof traffic in conjunction with selecting material.
- ❑ Time of year when work will occur.

First step in any re-roof contract is to determine if the roof should be repaired or replaced.

Inspect existing drains and specify cleaning drain lines, replacing flanges, and similar repairs as part of roof replacement contracts. Roof drain work below the roof deck is plumbing work and should be coordinated with the plumbing section of the specifications. Replacement of roof drain covers and inserts into existing drain lines is usually done by the roofing contractor.

TECHNICAL STANDARDS

National Roofing Contactors Association www.nrca.net
Roof coating Manufacturers Association www.roofcoatings.org

BUILT UP ROOFING

MATERIALS

Refer to the manufacturer for all components and specify work so that all products are provided by one source which prevents suppliers from backing out of their warranty.

Type III asphalt should be used at a minimum and Type IV asphalt shall be used if slope is greater than ¼" per foot. Cold process B.U.R. is acceptable and preferred on sites where odor is a concern. Minimum of type VI felts and a 4-ply system should be used. Minimum #4 lb lead is required for all drains and any other location where lead is used for flashing materials. Aggregate should meet the requirements of ASTM D 1863, 3/8" or 9 mm nominal. SBS modified FR cap sheet with granules is also acceptable as surfacing. No expanded poly styrene insulation will be allowed in any built up roofing system system. Roof insulation thickness shall meet the energy requirements of the current building code.

All materials and details should meet the requirements of NRCA, SMACNA, UL and FM.

DESIGN

Built-up roofs must have a minimum of 4 plies and minimum pitch of 1/4 inch per foot to drain. Built-up roofing can have up to a 25 year warranty which is longer than other membrane roofing warranties. The specifications should clearly specify the warranty period required for the project. Built-up roofing is preferred in family development where tenants may have access to the roof.

Minimum flashing height requirements are 8" for all mechanical, skylights, wall flashings or any other item that extends above the roof line. This is a

minimum flashing height; windows or other such items should be well above 8" above the roof line.

All mechanical equipment is required to be set on roof deck. No equipment should sit on insulation.

All aluminum (coping, counter flashings and edge metal) associated with roof system should be a minimum of 24 gauge (.032 inch) and color clad. Copper and lead coated copper can be used in certain applications.

Combine roof penetrations through the roof membrane as much as possible and avoid using pitch pockets.

EXECUTION

Do not install hot applied built-up roofs during winter months and avoid overheating hot asphalt during application which affects material performance.

Install cold applied built-up roofing according to manufacturer's installation requirements for warranty specified.

MODIFIED BITUMEN ROOFING

MATERIALS

Modified bitumen products are acceptable in appropriate circumstances over traditional built-up roofing. Modified bitumen roofing comes in either APP (Atactic Polypropylene, hot applied only) or SBS (Styrene Butadiene Styrene, hot or cold applied) membrane rolls.

Cold applied roofing or SBS is an alternative to using hot asphalt for built-up roofing or torch applied modified bitumen roofing systems. The cold applied can be solvent-based or water based. Acceptable manufacturers of cold applied modified bitumen roofing include Johns Manville, GAF, the Garland Company, Tremco and Suprema.

DESIGN

Determine if hot applied, torch applied or cold applied modified bitumen is appropriate for the project due to the location of the roof, access, occupancy etc. Modified bitumen roofing can have a 10, 15 and 20 year warranty which should be clearly specified in the specifications.

Cold applied roofing eliminates the odors associated with hot asphalt built-up roofing and in areas that have difficult access for hot asphalt equipment such as high rise buildings. Cold applied roofing can be applied year round with specialized equipment and is particularly effective in cold weather. Cold applied modified bitumen roofing can also be used in "green roof" installations under soil and plant materials to provide a waterproof membrane. Garland's GreenShield System is an Energy Star approved commercial roofing system.

EXECUTION

APP modified bitumen roofing is applied using a torch.

SBS modified bitumen roofing can be installed by heat welding, hot asphalt, cold applied adhesive, mechanical attachment or as part of a self-adhered system.

Before work proceeds, a preinstallation meeting must be held with representatives from the manufacturer, architect, roofing contractor, general contractor, LHA, and DHCD.

Install modified bitumen roofing according to manufacturer's installation requirements for warranty specified.

PVC SINGLE PLY ROOFING

MATERIALS

Reinforced PVC is acceptable as a single-membrane roofing system and is much preferred over EPDM Acceptable manufacturers include Sarnafil, GAF, Carlisle, Fibertite and Johns Manville.

Unacceptable: Stevens Hypalon and unreinforced PVC products by Trocal.

Use PVC membrane in either 45 or 60 mils complying with ASTM 4434, Type 1. Thicker PVC membrane is available and can be used in certain circumstances.

DESIGN

Unlike black EPDM rubber roofing, PVC roofing comes in white or light colors and can reduce energy consumption, abate urban heat and help to slow the reaction of smog forming pollutants. The light color provides a high level of solar reflectance for urban settings and reduces the amount of energy required to maintain comfort in an air-conditioned building by reducing heat flow through the building envelope. Sarnafil's EnergySmart Roof has an Energy Star listing in certain applications.

PVC roofing can also be used in "green roof" applications under soil and plant materials to provide a waterproof membrane. Sarnafil offers a range of waterproofing systems specifically for Green Roofs.

Specify products with welded seams and minimum 15 year warranty.

Combine roof penetrations through the roof membrane as much as possible

EXECUTION

Before work proceeds, a preinstallation meeting must be held with representatives from the manufacturer, architect, roofing contractor, general contractor, LHA, and DHCD.

Install PVC roofing according to manufacturer's installation requirements for warranty specified.

TPO ROOFING

MATERIALS

TPO (thermoplastic polyolefin) roofing is a new product to DHCD and the designer must demonstrate to DHCD why it should be used over PVC roofing. Acceptable manufacturers include Carlisle, GAF, EP Roofing Membrane by Stevens and Glenflex Heat-Welded Reinforced TPO Membrane. TPO are produced in white and light colors offering rooftop reflectivity to reduce air conditioning loads.

DESIGN

Specify white or light colored products with one or two side welded seams and minimum 15 year warranty. TPO membranes carry an Energy Star listings in certain applications with reflectivity ratings in the high 80 percent range where Energy Star specifications require 65 percent minimum. A benefit of using TPO roofing is that it is available in sheets up to 12 feet wide.

Combine roof penetrations through the roof membrane as much as possible

EXECUTION

Before work proceeds, a preinstallation meeting must be held with representatives from the manufacturer, architect, roofing contractor, general contractor, LHA, and DHCD.

Install TPO roofing according to manufacturer's installation requirements for warranty specified.

EPDM RUBBER ROOFING

MATERIALS

Specify complete EPDM (Ethylene Propylene Diene Monomer) rubber roofing systems (including all roof components) to ensure that the installation does not void the manufacturer's warranty.

Consider the comprehensiveness of the manufacturer's warranty when selecting a roofing system. Warranties vary with the manufacturer and installer. The minimum standard warranty should be 15 years.

Use EPDM in either 45 or 60 mils thickness complying with ASTM D 4637, Type 1. 90 mils thickness is also available by EPDM roofing manufacturers.

Use uncured neoprene flashing at penetrations for membrane roofs.

07 50 00 • MEMBRANE ROOFING

DESIGN

Flat roofs with single-ply membranes must have a minimum pitch of 1/8 inch per foot for positive drainage. Single-ply membranes should not be installed on roofs with a pitch of over 2 in 12. Use parapets if possible and run roofing up wall in lieu of gravel stops.

EPDM roofing can be installed fully-adhered, mechanically-fastened or loose laid. Fully-adhered EPDM using water or solvent based adhesives to adhere the rubber to the substrate is preferred. Mechanically-fastened EPDM roofing should be avoided. A ballast of light colored round river rock or concrete pavers is used to hold the materials in place and in roof locations susceptible to high winds. For re-rroofing projects ballast can be washed and reused.

Combine roof penetrations through the roof membrane as much as possible to limit the number of penetrations. Develop details, or refer to the manufacturer's details, for each type of penetration including: skylights, hatches, vents, mechanical equipment, drains, and penthouses.

Specify products with welded seams and minimum 15 year warranty.

EXECUTION

Install sheets as large as possible to minimize the number of seams. Specify that the Contractor should provide a seaming diagram before installation. The seams are sealed using either an adhesive or a splice tape.

Before work proceeds, a preinstallation meeting must be held with representatives from the manufacturer, architect, roofing contractor, general contractor, LHA, and DHCD.

Do not rely solely on field inspections by the manufacturer's representative to ensure the quality of the installation. Use a clerk when possible or provide the architect more field supervision time in the contract.

Install EPDM rubber roofing according to manufacturer’s installation requirements for warranty specified.

ROLLED ROOFING

MATERIALS

Rolled roofing comes in rolls composed of roofing felt saturated and coated on both sides with asphalt which contains fine mineral stabilizer. Asphalt rolled roofing is available smooth-surfaced or mineral surfaced. Smooth surfaced roll roofing is not as durable as mineral-surfaced roll roofing and is not recommended. Mineral-surfaced rolled roofing is available in 36 feet long rolls with the entire surface covered with granules, with a 2- or 4-inch bare lapping edge and with a 19-inch bare lapping edge.

07 50 00 • MEMBRANE ROOFING

DESIGN

Use rolled roofing on low slope roofs with a pitch of 1 inch to 6 inches per foot.

EXECUTION

Coated roll roofing should only be applied in warm weather when the material is flexible. Avoid exposed nails wherever possible. A blind nailed 4 inch lap cemented with plastic asphalt gum is preferred to a 2 inch lap with exposed nails.

ACCESS WALKWAYS

MATERIALS

Ensure that access walkways are compatible with the specified roofing system. The benefit of a ballasted roof is that pavers are not required.

Pre-cast solid pavers are an acceptable material. Avoid organic materials such as wood or felt. Use walkway protection boards that are compatible with the roofing membrane that is being used on the project.

DESIGN

Walkway protection requirement may be needed where tenants have emergency egress on roof between stair penthouses. Railings should also be designed and installed to direct traffic over roof and pavers or stone ballast installed.

ROOF COATINGS

MATERIALS

The application of white liquid roof coatings on existing membrane roofs helps to prolong the life to the roof and reflects the sun's UV rays and infrared radiation. Manufacturers include Snow Seal by Ames and CLP Liquid Roof by US Coatings Solutions.

EXECUTION

Apply roof coatings according to manufacturer's installation requirements for warranty specified.